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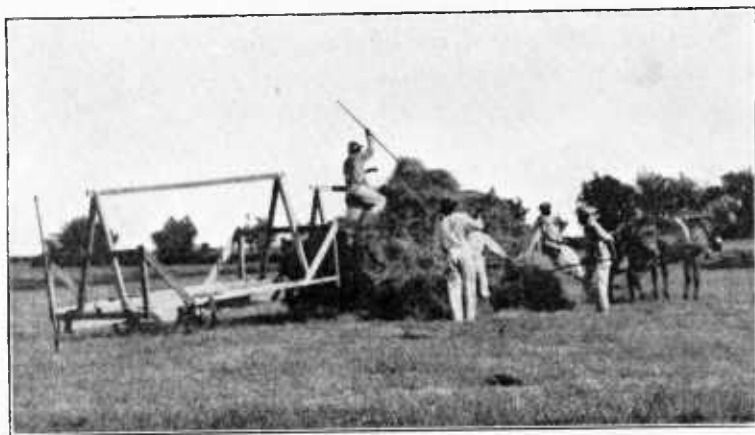
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# CURING HAY ON TRUCKS

A METHOD BY WHICH A GOOD QUALITY  
OF HAY MAY BE CURED DURING  
UNFAVORABLE WEATHER

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FARMERS' BULLETIN 956

UNITED STATES DEPARTMENT OF AGRICULTURE

OFFICE OF THE SECRETARY

Contribution from the Office of Farm Management

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Washington, D. C.

May, 1918

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**T**HE CURING truck is a device which supports hay during the curing process, protecting it from rain, and from moisture in the ground, and makes reasonably certain the production of a good quality of hay, even during unfavorable weather.

It requires no more man labor or horse labor for loading, unloading, or hauling than do the more familiar methods of curing.

This truck is the most economical and efficient device known for the successful making of hay in certain parts of the South, and can be recommended for large acreages, especially of alfalfa, in any section where the production of hay is a more or less hazardous undertaking on account of the prevalence of rainy or cloudy weather.

In counting the cost of this method, the items of repairs, interest, and depreciation may appear large, but any increase in these items is more than offset by the great gain in efficiency; considering the average loss of hay cured by ordinary methods in rainy weather. For instance, at the present price of Johnson grass hay, much grown in Southern States, the total cost of the trucks used in harvesting it by the method here described will be repaid by a saving over other methods of less than 1 per cent of a single crop.

Farmers living in humid regions and southern hay growers in particular will find it well worth while to investigate fully the advantages of the curing truck.

## CURING HAY ON TRUCKS.

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### THE SOUTHERN HAY INDUSTRY.

**G**ROWING HAY for the market is a profitable business in certain sections of the South when a good quality of hay is produced. In Georgia, Alabama, and Mississippi, especially in the part known as the "Black Belt," growing hay for the market is becoming the leading enterprise on many farms. The principal kinds of hay grown for market are alfalfa, Johnson grass, and alfalfa and Johnson grass mixed hay.

The growing of hay for the market received a great impetus in these sections when the boll weevil made it impossible to grow cotton as extensively as formerly. Hay is well adapted as one of the crops to take the place of cotton in the sections infested by the boll weevil. It is easily grown, is in constant demand and, under certain conditions, is highly profitable. In this connection, however, care should be taken to avoid an overproduction of low-grade hay.

Johnson grass has been known in the South for many years and, until recently, has been regarded as one of the worst weed pests the farmer has had to contend with in the growing of cultivated crops, if not the very worst. Alfalfa grows well in the black soils of the South, but usually it can not be grown alone. Johnson grass will grow in spite of the usual efforts to get rid of it. Therefore those desiring to grow hay have stopped fighting Johnson grass and are now encouraging its growth. They can either grow it alone or with alfalfa; and the Johnson-alfalfa mixture makes an excellent hay, especially for horses. The hay-making season covers a period of several months, and from three to five cuttings are obtained per year. Growing hay in the South is accomplished without any very great difficulties.

The great drawback in producing hay is the difficulty in curing the hay during unfavorable weather. The hay-curing truck de-

scribed in this bulletin was designed to enable the grower to cure hay during rainy and cloudy spells of weather when all ordinary methods of curing in the field failed. The advisability and advantages of using the truck depend upon the possibility of avoiding by its use the greater part of the loss annually sustained by ordinary methods of curing.

#### LOSSES DUE TO UNFAVORABLE WEATHER.

Unfavorable weather during the haying season causes a loss to the grower in two ways. The first is due to the loss sustained by undue exposure of the hay to sun and rain. This includes the loss of color, which may be caused by either rain or sun and results in lowering of the selling price. The loss may go farther than simply loss of color. Hay in the cock may become moldy and unfit for feeding. Continued handling will cause a high percentage of leaf loss in alfalfa and other legume hay, which lowers its total nutrients. The second loss is due to the extra work involved when it becomes necessary to handle the hay to prevent spoiling. When hay in the cock becomes wet through with rain it is necessary to open the cocks and spread out the hay to prevent heating. Sometimes it is necessary to recock the hay after it has been spread out, and finish the curing in the cock. This extra labor increases the cost of making hay, and thereby decreases the profits.

#### HAYING WEATHER IN CENTRAL GEORGIA, ALABAMA, AND MISSISSIPPI.

The economy of using the curing truck depends upon the kind of weather prevailing during the haying season. Figure 1 shows the average monthly rainfall, number of days with 0.01 inch or more of rain, number of clear days, and number of cloudy or partly cloudy days for each month from May to October, for five stations, Augusta, Ga.; Montgomery, Ala.; Uniontown, Ala.; Demopolis, Ala.; and Agricultural College, Miss. The records have been kept so long (from 8 to 37 years) that the averages form a fair basis for knowing what kind of weather the hay grower will have to contend with while making hay.

The chart is arranged with the station having the greatest seasonal rainfall (Augusta, Ga.) at the top, and that having the least (Agricultural College, Miss.) at the bottom.

During the four months of May, June, July, and August, in which the greater portion of the yearly hay crop is harvested, 26 per cent of the days are rainy and 37 per cent clear in the Demopolis section, and 37 per cent are rainy and 33 per cent clear in the Augusta section. These two stations represent the maximum and minimum for percentage of rainy days at the five stations. For the combined

records during the four months 33 per cent of the days are found to be rainy, 24 per cent cloudy or partly cloudy, and 43 per cent clear.

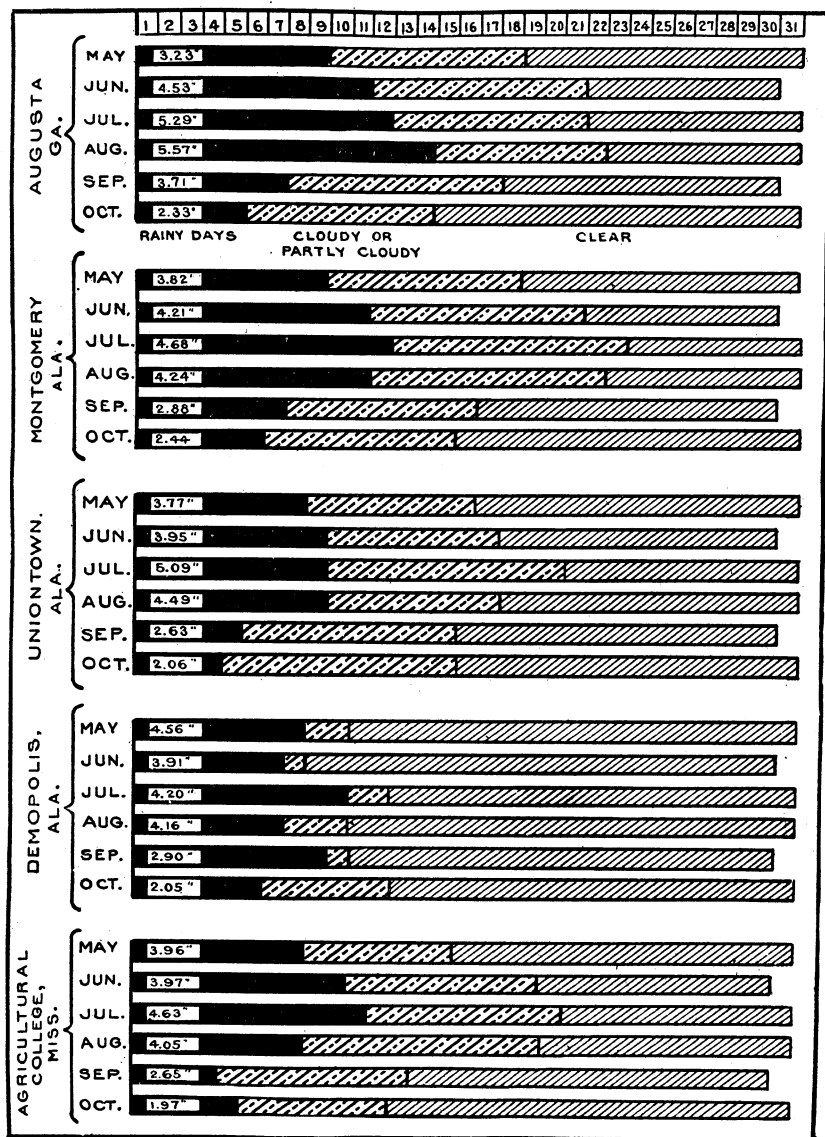


FIG. 1.—Relative numbers of rainy, cloudy, and clear days in the haying months at selected points in central Georgia, Alabama, and Mississippi. (Black, rainy; heavy shading, cloudy; light shading, clear.)

These data will materially assist the hay grower in determining whether or not to use the curing truck.

## ORIGIN OF THE CURING TRUCK.

Unsatisfactory results obtained from curing hay by common field methods led Mr. J. E. Evans, of Monroe County, Miss., to experiment with different devices that would aid in securing a better quality of hay. Before the advent of the curing truck the best known method for that locality was to cure hay in well-made cocks containing from 100 to 600 pounds of cured hay.

During favorable weather, or even during transient unfavorable weather when only light showers occur, a fair quality of hay can be made by curing in the cock. If, however, the weather continues unfavorable for a period of a week or more and is marked by frequent heavy rains, the cocked hay will usually become wet through. The bottom of the cock will absorb moisture from the damp ground and spoil the hay. After the rains cease it is necessary to spread out the hay and sometimes recock, and when the hay is finally cured sufficiently to be baled or put into the barn or stack it will be of a very poor quality.

Hay caps can be used to advantage to keep the rain from entering the top of the cock, but even then the hay in the bottom will sometimes be damaged from the moisture in the ground unless some special device is used to prevent it. Various types of racks, frames, etc., holding from 100 to 2,000 pounds of cured hay have been designed and used more or less successfully when quality only is considered. Such devices usually require considerable extra-man labor in putting the hay on and getting it off the apparatus.

The device sought by Mr. Evans was one that would first permit the rapid handling of the partly-cured hay; one that would keep the hay off the ground and entirely protected from the rain while curing; and, lastly, one that would require but little labor and time in moving the hay after it was cured out ready for baling. The curing truck, as finally worked out, embodies all the essentials of these ideas. (See fig. 2.)

## DESCRIPTION OF THE TRUCK.

The curing truck is quite similar to the ordinary hayrack. (See fig. 3.) It is 12 feet long and 7 feet wide and will hold from 1,500 to 2,000 pounds of cured hay, depending on how much the hay is cured when put on the truck. The back is supported by two 16 to 20 inch steel or iron wheels running on an axle placed about 4 feet from the rear end of an A-shaped frame.<sup>1</sup> When a loaded truck is not in motion, as when left in the field for the hay to cure or while it is waiting to be baled, the front end is supported by a 6 by 8 inch wooden block or "trigger" of sufficient length to hold the truck level.

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<sup>1</sup> Wheels suitable for this purpose may be secured from mail-order houses.

This trigger is fastened between the two main frame timbers by a heavy bolt, enough play being left so that it swings easily by its



FIG. 2.—Right, loaded truck protected by a canvas cover. A well-loaded truck will contain about 1 ton of cured hay. Left, empty truck.

own weight. When the trigger is in use, it is held in a position just past the vertical, by coming into contact with the front coupling

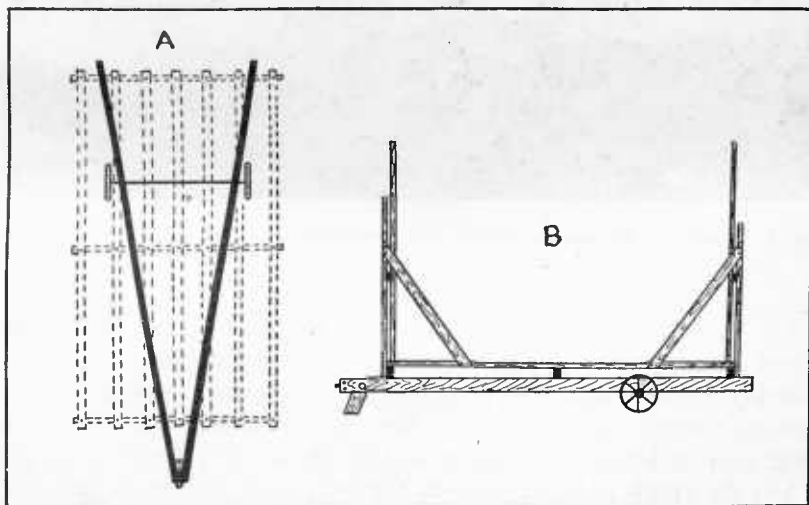


FIG. 3.—Main frame of truck (A), with rack indicated by dotted lines, and side view (B) showing trigger and position of wheels.

casting. When the trigger is not in use, the free end, pointing to the rear, drags lightly on the ground.



The standards at each end run to a point at the top, in which a notch is cut to receive a 2 by 4 inch ridgepole that supports the canvas and keeps it from lying flat on the hay, thus permitting the air to circulate freely at the top. The bottom is made up of seven 2 by 4 inch pieces, 12 feet long, evenly spaced to allow the air to enter freely. A coupling device is fastened to each end. The front coupling consists of a heavy, rigid ring, set in a cast-iron block, and the back one is shaped in the form of a hook. The couplings make it possible to haul a train of several empty trucks when returning them to the field. (See fig. 4.)

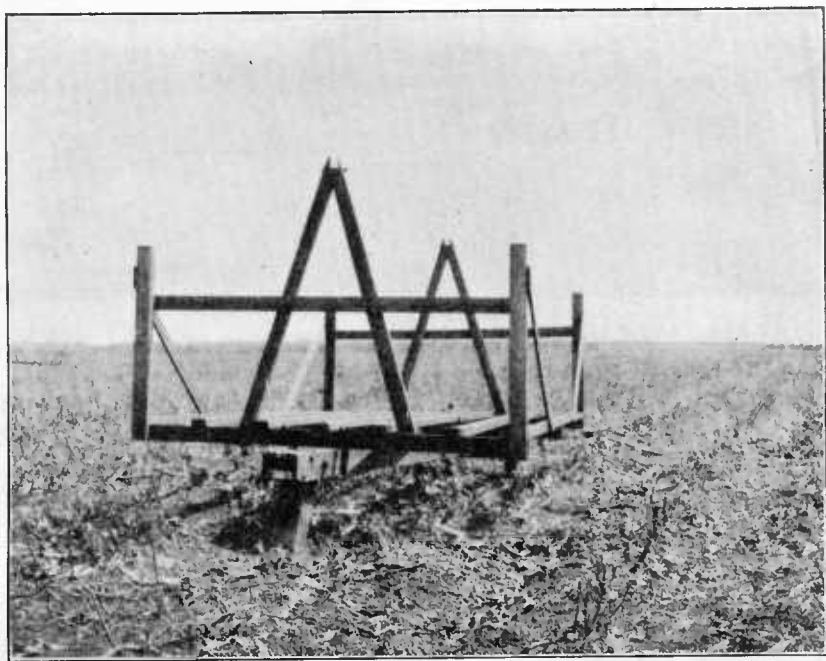


FIG. 4.—Empty truck, showing details of construction. A 2 by 4 ridge pole is held by the notches at top of standards. Note position of the "trigger" which holds the truck level.

The trucks are moved by means of a two-horse team and a two-wheel running gear similar to the front running gears of a low-wheeled wagon. A seat is provided for the driver, to be used when moving a truck some distance. (See figs. 5 and 6.) The front running gear is fastened to the truck by means of a long clevis pin. When the truck is being hauled, the weight of the front end rests on the front running gear. When the team starts, the forward movement causes the trigger to trip as it passes center and to drag on the ground, the weight of the load being thus shifted to the running gears. Upon reaching the destination the team is backed a step or

two, which causes the trigger to assume its upright position and again take its share of the weight of the load.



FIG. 5.—Front running gear used to haul trucks. It is attached easily by means of a long clevis pin. At left, Mr. Evans, who developed the method of curing hay described in this bulletin.

#### USING THE TRUCK.

In order to use the truck successfully, hay must be cured to a certain point before it is put on the truck. If not sufficiently cured,

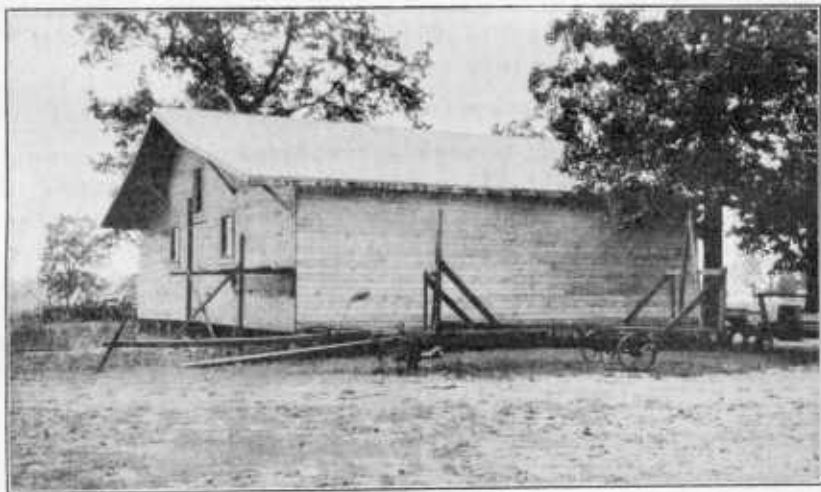


FIG. 6.—Front gear coupled to empty truck. When the team starts forward the "trigger" trips and lower end drags on the ground.

there is danger that it will heat and spoil. Hay put on the truck when almost cured will not have as good a color as hay put on with

the proper degree of curing. Hay is in best condition to be put on the truck when it has cured enough to go into the cock or possibly just a trifle greener than when it ordinarily is cocked, as it is desirable to do the last third or fourth of the curing on the truck under a canvas cover, where it is protected from the sun and rain.

In order to have the hay in proper condition to be put on the trucks at a set time of day, it is necessary to arrange the time of mowing, tedding, raking, bunching, etc., so the hay will be ready when desired. Mr. Vester S. Mullins, of Noxubee County, Miss., uses the following method:

When the yield is light, say, about one-half of a ton per acre, the hay is mowed in the morning, raked in the afternoon, and put on the trucks in the evening, or the next morning, after the dew is off. When the yield is about 1 ton per acre, hay is mowed in the morning and tedded the next morning and raked into windrows before dinner. The hay is allowed to lie in the windrow only two hours before being put on the trucks.

#### **BUNCHING HAY TO BE LOADED.**

Hay may be taken directly from the windrow and loaded by hand onto the truck, but this is not a good practice, because it requires too much time to pitch hay up from the windrow and not leave any scatterings. It also obliges one man to spend much of his time in driving the team hauling the truck, when he might be better engaged in helping load.

The best practice is to bunch the hay after it has been raked into the windrow. This may be done with a sulky rake or a push rake. The sulky rake puts a much smaller amount of hay into a bunch than the push rake, and it is not as efficient an implement as the latter if more than two men are used to load the truck.

#### **HANDLING AND LOADING THE TRUCKS.**

Before the crew starts to work it is customary to bring several empty trucks to the field. Empty trucks are hauled to the field in trains of from 6 to 10 (fig. 7). Enough trucks should be brought to the field before loading is begun to last all day or at least half a day. This practice will save time, as the loading crew will not have to wait while trucks are being brought from a distance. If enough trucks are taken to the field in the morning to last until noon, the mower, rake, and push-rake teams may be used to haul trains of trucks to the field when returning to work after dinner.

The trains are left at different places in the field so as to be quickly accessible. Two trucks are used when loading starts. The front truck is loaded first and the second one is trailed behind to save time, since it does not add enough weight to make any material difference to the team. After the first truck is loaded the sides of the load are raked down carefully with pitchforks to cause the hay to

shed rain more easily, and a canvas is put on and tied at the four corners. This work is done while the team is being hitched to the second truck. The canvas is always put on, even if there is no indication of rain. When the second truck is nearly loaded, the driver unhitches his team and goes for two more empty trucks from the nearest train. While he is doing this, the pitchers, if necessary, carry a few forkfuls of hay from the nearest bunches to finish out the load. The loaded truck is left standing where the last hay is put on. There are two reasons for this practice; the more important one is that it is not advisable to haul loaded trucks very far over the ordinary hay field. The truck wheels are comparatively small and the average alfalfa and Johnson grass hay field is more or less rough, sometimes being very bumpy and uneven; and hauling shakes the hay and causes it to settle and become compact, preventing the cir-

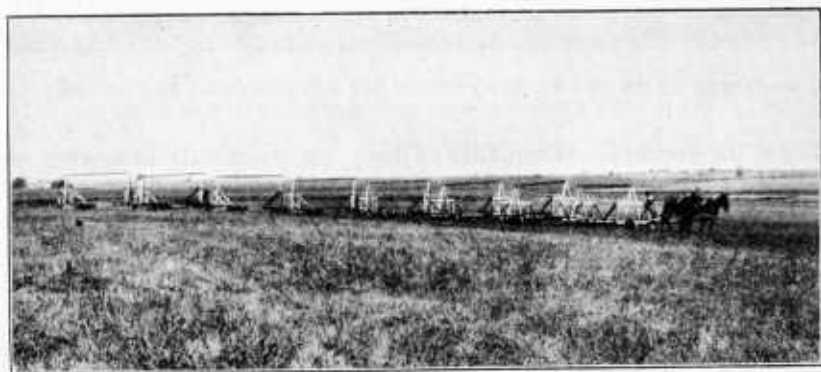


FIG. 7.—A train of eight empty trucks being hauled to the field. The trucks are left at points in the field where they are quickly accessible.

ulation of the air, prolonging the curing process, and thereby increasing the danger of loss from heating. Also, if each truck were hauled to a central point it would be necessary to have a much larger number of teams, drivers, and front running gears in order to keep the loading crews busy all of the time. When the hay has all been loaded, the fact that the trucks are left scattered over the field nearly equidistant from each other indicates that the hay has been hauled no farther than absolutely necessary. (See fig. 8.)

#### SIZE OF LOADING CREWS.

Loading crews consist of two, three, or four men. A two-man crew can load about 14 trucks in 10 hours. Both men pitch onto the truck until the load is two-thirds on, when one man works on the truck, building and finishing off the top. When three men are used, one stays on the truck all of the time and builds the load and the other two pitch on the hay. (See figs. 9 and 10.) They will load about 20

trucks in 10 hours. A four-man crew may work in two ways; three men may be used to pitch on the hay if they are careful in placing the forkfuls on the truck in such a manner as to keep the hay level and

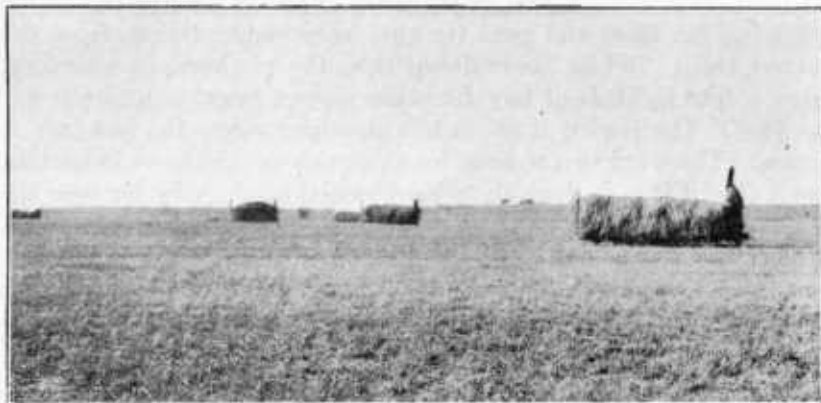


FIG. 8.—Trucks are left standing where the last hay is put on them. Hauling causes the hay to settle, which retards the curing, and causes loss of time.

fill out the corners. When this is done, one man only is needed on the load. The other method is to use two to pitch and two on the load. The two pitchers are then not concerned about where their forkfuls land on the load. All they need to do is to get as much hay



FIG. 9.—Loading the truck. When three men are used two pitch and one builds the load. One of the pitchers drives the team.

as possible onto the truck, leaving the placing of the hay to the two men building the load. A four-man crew should load, on an average, about 30 trucks in 10 hours. The average time required to load a truck by a two, three, and four man crew is 40, 30, and 20 minutes, respectively.

## LOADING IS NOT EXTRA LABOR.

Some objection to the use of the trucks has been made on account of the necessity of loading them by hand. This objection is raised only by those who have not compared the amount of man labor required per ton when hay is cured in the cock with that required when the truck is used, for, as a matter of fact, less hand labor is needed when using the truck than when hay is cured in the cock.

Hay is raked with the sulky rake and bunched with the sulky rake or push rake in exactly the same manner whether cocked or put on the truck. If cured in the cock it is necessary to put the hay into carefully made cocks and each forkful must be placed exactly right to form a cock that will be symmetrical. When the truck is used it is not necessary to be so careful where each forkful is placed or just how much is taken up with the fork at a time. A man can handle more hay per hour or per day when pitching onto a truck than



FIG. 10.—Two men are sometimes used to load trucks. One man works on the truck after half of the load is on. The other man pitches and drives the team.

when building cocks, so that as far as labor requirements are concerned loading the truck has the advantage over cocking.

## TIME REQUIRED TO CURE ON TRUCKS.

In good curing weather hay is in condition to be baled after curing three days on the truck. If the hay is a little green when put on the truck or the weather is unfavorable, it will take a week or possibly longer to cure out thoroughly. Hay may remain on the truck indefinitely, if well protected by a canvas cover, without injury from sun or rain when the truck is not needed for some time, as is often the case when a cutting is all finished. Some users of trucks put two canvases on each truck when they are to be left standing for a considerable time before being baled. A single canvas cover placed lengthwise covers the top well but does not protect as much of the sides of the load as do two canvases put on crosswise. It is sometimes

customary to place two canvases on each truck when there are prospects of a hard wind-driven rain. When hay is on the truck and protected in this manner, the hay grower's mind is at ease; and no matter how hard the storm may be or how long it may last, he is satisfied in the knowledge that his hay crop is safe and will bale up, having a good color and quality. Constant worry about the uncertainty of when and how much it will rain is the nightmare of the southern hay grower, and unfavorable weather is the greatest factor in preventing a larger acreage of hay in the South.

### **BALING.**

#### **ADVANTAGES OF USING THE TRUCK WHEN BALING.**

Baling hay cured on trucks has several advantages over baling hay cured in the windrow, bunch, or cock. In the South a day's work is from sun to sun. Hay cured in the ordinary way can not be baled until the dew is gone, and the hayfield hands must be employed on other crops during the early part of the morning. Hay cured on trucks can be baled as early in the morning as desired. The canvas cover protects it from dew and a full day's baling can be done unless rain interferes.

Baling from the windrow, cock, or bunch is stopped by a light shower for some little time, and a heavy short shower will prevent baling for the remainder of the day. Showers stop baling from trucks only while rain is falling, since each truck is protected by a canvas and it is a matter of only a moment to throw one over a truck that is partly baled. When the rain is over the press crew can start to work again. These two advantages in using the truck are of considerable importance when farm labor is scarce, as it is at present in the South.

#### **HAULING TRUCKS TO PRESS.**

Truck-cured hay is usually baled in the field where it is grown. This is done for the reason that it is easier to move the press than to haul the hay long distances, as is the case where the hay is baled at the barn. One man and a good stout team are used to haul the loaded trucks to the press, and they can easily bring enough hay to keep the press going to full capacity, which is about 30 tons in 10 hours for a very efficient, fast-working crew. If the haul becomes so long that one man and team can not bring in the hay fast enough, the press is moved nearer to the hay. If the press is properly located when starting to bale up a field of hay, it need never be necessary to move it the first day, and sometimes not for two or three days, depending upon the yield. Moving the press should be done before the press crew begins work, at noon, or after the day's work is over, in order to avoid loss of time by the crew.

It is a good practice to have several loaded trucks hauled to the press before the press is started. (See fig. 11.) These should be brought from the distant parts of the field. The man and team hauling the trucks should always be at the press in time to place a truck in position to be unloaded just when it is needed. It is not necessary to hitch the team on the empty truck to haul it out of the way, for one man can easily do this by taking hold of the front end. As soon as a loaded truck is in position for unloading, the man hauling can start for another truck at a distance that will allow him to reach the press with his load by the time the last truck placed is unloaded.

#### STRIPPING THE HAY.

It will sometimes happen that the rain will wet in several inches of the sides of the hay below the canvas. This sometimes occurs



FIG. 11.—A "town" of loaded curing trucks. Loaded trucks are sometimes brought to a central point or "town" after the hay is thoroughly cured and is not to be baled for some time.

when one canvas is used, but is prevented when two are used. If the hay is not to be baled immediately, but little if any damage is done by the rain. If it is desired to bale it before the dampness is all out (it is understood that the hay was ready for baling when the rain occurred), the best thing to do is to "strip" the sides of the damp hay.

The stripping is done by hand in this manner: One man, detailed for this work, runs his hand under the hay and when he feels a damp place, pulls out the hay in each spot. The rain does not always run in along the whole side of a truck, but often just at places where the sides were not raked down carefully, but were left rough and did not shed water. After the damp hay has been removed from the spots it is spread out on the ground to dry and is afterwards baled. As a matter of fact a little damp hay might not make much difference in the feeding value of a 100-pound bale, but should a bale



show some bad hay on the outside, the buyer might be suspicious of the entire contents of the bale.

#### PRESS CREW.

The press crew is of the same size as when hay is baled from the cock, viz: One man to haul trucks, two to run wire and tie, one off-bearer, one feeder, two to three pitchers, and sometimes an engineer. A crew can bale about as much as when baling from the stack. The only time lost is while waiting for the empty truck to be pushed away and a loaded one brought up. It should not be necessary to lose over half a minute in doing this if the hauler is doing his full duty.

#### CARE OF BALED HAY.

To take care of the baled hay and prevent injury from rain or damp ground a large canvas should be kept handy where it can be thrown over the bales in case of a sudden rain. The safest plan is to haul the bales to the barn as soon as they come from the press.

#### ECONOMIC CONSIDERATIONS.

##### OTHER USES FOR THE TRUCK.

In addition to its primary use as a haying implement, the truck can be used to advantage in protecting bound grain from the rain until it is ready to be thrashed. It is also very handy in hauling corn to the silo, etc.

##### LIFE OF TRUCK.

The life of a truck depends, as with any other kind of farm machinery, on the care it receives. If a truck suffers hard or careless treatment, such as being overloaded and driven over very rough ground or into small open drainage ditches, it may not last very long. Such handling usually results in a number of trucks being badly injured or destroyed each year.

The truck is, however, a very simply constructed implement. It has no rapidly-moving or delicate parts to wear out, and it is not subject to deterioration by rust. It should last 10 years at least, or longer if a reasonable amount of care is exercised and no serious accident occurs to it. A good canvas will last about 10 years if it is well cared for and never put away when damp.

##### AMOUNT OF WORK PERFORMED.

Mixed alfalfa and Johnson grass hay is cut from three to five times a year. In an average year one can count on four crops. Assuming that it is necessary for hay to remain on a truck an average of 7 days or less and that it takes three weeks to harvest each cutting, each

truck will be used 12 times a year. Thus, in 10 years each truck will be used 120 times, and if one ton is put on at each time it will cure 120 tons during its life.

#### REPAIRS, INTEREST, AND DEPRECIATION.

The repairs on the truck are so small that this cost may be entirely disregarded. About the only upkeep cost is that of greasing the axles once a year. A truck and 12-ounce canvas, 9 by 14 feet in size, cost about \$20 in 1914. Interest at 8 per cent will amount to \$8.80, assuming that the truck is worn out at the end of 10 years, making interest and depreciation or replacement charges amount to \$28.80 during the life of the truck. If 120 tons are cured during the life of the truck, the total cost of using the truck will amount to 24 cents per ton of hay cured.

#### COST OF EQUIPMENT FOR 100 ACRES OF HAY.

The average yield of alfalfa and Johnson grass hay in the South is about three-fourths of a ton per cutting when the meadow is cut four times a year. One hundred acres will yield 75 tons per cutting. If a truck can be used three times per cutting 25 trucks will be required for 100 acres of hay. The 25 trucks and 25 canvases will cost \$500, or at the rate of \$5 per acre initial cost.

A cash outlay of \$5 per acre for every acre of hay land may, at first thought, seem to be prohibitive. However, when considering the cost of using the truck, 24 cents, or even double this amount, is a comparatively small amount to expend to insure the making of a ton of first-class hay. Some users of trucks claim and are positive that during a very unfavorable year a truck will pay for itself in one season. Twenty-four cents is about the cost of push-raking hay from the cock or windrow to the stack or press, and the writer has found that men who use the truck extensively are of the opinion that it is better to spend this amount and be reasonably sure of always getting a fair to choice grade of hay than not to use the truck and to have to stand heavy loss due to hay spoiled and lowered in quality by rain every year.

If hay is selling at \$20 per ton, assuming that the total cost of a truck is 24 cents per ton handled, the total cost of using a truck in harvesting a ton of hay would be repaid by the saving of but 24 pounds of hay.

#### LIMITATIONS OF THE TRUCK.

The writer wishes to caution those who may be led to adopt the method of curing described in this bulletin, that they must not expect all of the hay cured on the truck to be "choice." Artificial drying in kilns, heated either by means of steam or hot air, is the only method that will guarantee "choice" hay under all conditions.

However, curing on trucks is surpassed only by artificial curing, and is the best known method of curing in the field at a small cost of equipment. The reason why curing on trucks will not invariably make "choice" hay is that hay is often damaged more or less by rain before it is in condition to be put onto the truck. It may rain on the hay one or more times between the times the hay is cut and it is ready to be put on the truck.

If the rain comes before the newly mown hay has started to cure, the damage may be very slight. It is the intermittent wetting and drying out that causes the greatest damage to curing hay. When this happens, neither the curing truck nor the artificial drier can restore the hay to its former color and quality. However, when such hay is finally in condition to go on the truck there will be no further loss.

No matter what other method of field curing is used, the farmer must always run the risk of having his hay damaged or ruined before it can be protected from rain and sun. The point that the writer wishes to emphasize is that *the curing truck eliminates all danger of the hay spoiling either by loss of color or quality, after it has been put on the truck in proper condition and is properly protected by a good canvas cover.*

An up-to-date hay maker with a well organized and efficient haying crew, who takes every possible advantage of good weather, can use curing trucks to great advantage in certain parts of the South and Southeast.

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